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(19) (CA) **APPLICATION FOR CANADIAN PATENT** (12)

(54) Ramp King with Folding Tailgate

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(73) C.H.M. Manufacturing Limited - Canada ;

(57) 8 Claims

Notice: The specification contained herein as filed

Canada

TECHNICAL FIELD

The present invention relates to a vehicle loading ramp and more particularly, to a loading ramp adapted to serve as a tailgate in the folded position.

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BACKGROUND OF THE INVENTION

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The loading and unloading of bulky, heavy objects from a vehicle such as a truck has presented a problem for some time. For example, the weight of the object may be such that it renders manual loading almost impossible. Alternative solutions have been developed to address this problem. One such solution involves the use of ramps. These however are bulky, rendering their handling at the loading site difficult. Further, such ramps take up considerable storage space when not in use. Recently vehicle tailgates that are capable of also being used as loading ramps have become available.

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One example of such a convertible tailgate is disclosed in Canadian Patent No. 1,238,156 of Hanson issued June 21, 1988. That patent discloses a vehicle tailgate ramp including two separate foldable flow-through ramps. Each ramp after use, is removed and folded for storage in a movable tailgate frame at the rear of a vehicle. This device still requires a lot of manipulation before loading and/or unloading can be achieved. Canadian Patent No. 847,002 issued July 21, 1970 to Hall illustrates a flow-through vehicle loading ramp which may be

attached to the tailgate of a vehicle. United States Patent No. 4,761,847 issued August 9, 1988 to Savage relates to a portable folding ramp and is of general background interest.

It is an object of the present invention to provide an improved vehicle tailgate ramp assembly wherein the vehicle tailgate functions as a ramp when unfolded.

SUMMARY OF THE INVENTION

In accordance with the present invention a foldable vehicle tailgate ramp assembly is provided. The ramp comprises a plurality of rectangular ramp panels, each having top and bottom surfaces and longitudinal and lateral sides. The first of these ramp panels is pivotably mountable to a vehicle to form a tailgate. The tailgate is adapted when in position on the vehicle to swing about an axis adjacent a lower longitudinal side of the first panel between a closed, vertical first position to a second open, ramp position. Means are provided to pivotably connect the ramp panels along adjacent longitudinal sides so as to unfold into an operable ramp position with the panels held in coplanar relationship when the first of the ramp panels is in open position, and fold into a storage position with the first of the ramp panels in closed position. Means are provided to releasably secure the ramp panels in first position.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects and advantages of the invention will become apparent upon reading the following detailed description and upon referring to the drawings in which:

5 FIGURE 1 is a perspective view of the folded tailgate ramp assembly in accordance with the present invention on the rear of a pick-up truck;

 FIGURE 2 is a perspective view of the tailgate ramp assembly of FIGURE 1, unfolded as a ramp;

10 FIGURE 3 is a side view of the ramp of FIGURE 2. The folding of the ramp is shown in phantom lines;

 FIGURE 4 is a side view of the tailgate ramp assembly of FIGURE 1;

15 FIGURE 5 is a rear view of the vehicle tailgate ramp assembly of FIGURES 1 and 4 in a folded position;

 FIGURE 6 is a broken exploded view of the hinge assembly joining panels making up the tailgate ramp assembly of the present invention;

20 FIGURE 7 is a broken exploded view of a latching device for the panels of the present invention; and

 FIGURE 8 is a side view of the latching device of FIGURE 7.

25 While the invention will be described in conjunction with an example embodiment it will be understood that it is not intended to limit the invention to such embodiment. On the contrary, it is intended to cover all alternatives, modifications and equivalents

as may be included within the spirit and scope of the invention as defined by the appended claims.

DETAILED DESCRIPTION OF THE INVENTION

5 In the drawings, similar features have been given similar reference numerals.

FIGURES 1 and 2 illustrate respectively a vehicle tailgate ramp assembly 2 of the preferred embodiment of the present invention in folded and unfolded positions mounted on the rear of a pick-up truck 3.

10 As shown in FIGURE 2 the vehicle tailgate ramp assembly 2 of the preferred embodiment comprises a plurality of panels 4, each panel pivotably secured to its adjacent panel or panels, each of the panels having a top surface 6, a bottom surface 8, longitudinal sides 10 and lateral sides 12.

15 Referring to FIGURES 1 and 2, it can be seen that an innermost panel 13 is of such width that when folded it functions as a tailgate to completely enclose the rear of pick-up truck 3. The other panels 4 are generally of smaller width. The panels 4 are connected to each other by a hinge assembly 14, to be described
20 in more detail hereinafter, and are maintained in a folded position, when not used as a ramp, by a pair of spring-loaded latches 16 and a spider latch 18. A pair of conventional latches 19 at the top of the lateral sides of panel 13 releasably engage corresponding portions of the rear of pick-up truck 3 to enclose it
25 like a conventional tailgate and secure it in vertical position.

With reference to FIGURE 3 the longitudinal side 10 of each panel 4 is pivotally joined to a corresponding side 10 of an adjacent panel 4 by hinge means 14, details of which will be set out subsequently. Panel 13 is pivotably mounted at its bottom to vehicle 3 by hinge 22 to swing about an axis through that hinge from a first, closed position as shown in phantom to a second opened position as shown in full line. As shown in FIGURES 2 and 3 the top surfaces 6 of the panels 4 are substantially coplanar with respect to one another when the tailgate ramp assembly is completely unfolded. As shown in FIGURE 6, the construction of the hinge assembly 14 is such that when the panels 4 are unfolded to the extent that their top surfaces are coplanar, a stop block 24 limits any further relative pivotal movement of the panels in that same direction. When folded, the top surfaces 6 of consecutive panels 4 opposedly face one another.

As can be seen in FIGURE 2 each of the panels is, for example, reinforced by a plurality of longitudinal bracing members 26 affixed to expanded metal sheeting 28. To further reinforce and support the vehicle tailgate ramp assembly when in the unfolded position, a telescopic leg 30 is pivotally connected to longitudinal sides 12 of a panel 4 as illustrated. The precise location of the leg 30 will depend upon the length of the tailgate ramp assembly. The height of the leg 30 can be telescopically longitudinally adjusted so as to adapt to different height requirements. To give further strength to the tailgate ramp assembly in the unfolded position the first panel 13 when unfolded may or may not rest on bumper 32 of the vehicle 3.

FIGURES 4 and 5 illustrate the tailgate ramp assembly in folded position with the latches 16 and 18 retaining the ramp panels 4 in such position.

As can be seen in FIGURE 6, to enable the panels 4 to pivot with respect to each other, aligned hinge sleeves 34 are secured to different ones of the adjacent longitudinal sides 10 of adjacent panels 4 so as to receive hinge rod 36. Stop block 24 is welded to longitudinal side 10 of one ramp panel 4 while a surface bearing bar 38 is welded in confronting fashion to the corresponding longitudinal side 10 of adjacent ramp panel 4. In operation as the panels are unfolded, hinge sleeves 34 of each adjacent pair of panels for rotate around hinge rod 36 until stop block 24 rests against surface bearing bar 38. Stop block 24 is of such a construction that, when panels 4 are completely unfolded and coplanar, it prevents any further rotation of hinge rod 36 while abutting against surface bearing bar 38.

Spring-loaded latches 16, secured as illustrated to opposite lateral sides 12 of the panel 4 adjacent panel 13, are used to releasably secure the ramp panels 4 to the first panel 13 (FIGURES 7 and 8). Each latch 16 comprises a casing 40 encasing a spring 42 biased against a square spring stop 44 fixed within casing 40. A post 46, with flange cap 47, passes through the aligned holes 48 of casing 40 and is welded to one of the lateral sides 12 of lowermost panel 4 so that casing 40 can rotate on post 46. In operation a finger 50 activated by handle 51, acting against the bias of spring 42 secured thereto, is pulled until the finger grips lateral sides 12 of the other folded ramp panels 4 and

retains ramp panels 4 in folded position.

Thus it is apparent that there has been provided in accordance with the invention a vehicle tailgate ramp assembly that fully satisfies the objects, aims and advantages set forth above.

5 While the invention has been described in conjunction with a specific embodiment thereof, it is evident that many alternatives, modifications and variations will be apparent to those skilled in the art in light of the foregoing description. Accordingly, it is intended to embrace all such alternatives, modifications and
10 variations as fall within the spirit and broad scope of the invention.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE
PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A foldable vehicle tailgate ramp assembly comprising:
 - (a) a plurality of rectangular ramp panels each having
5 top and bottom surfaces and longitudinal and lateral
sides; wherein a first of these ramp panels is
pivotably mountable to a vehicle to form a tailgate
adapted when in position on the vehicle to swing
10 about an axis adjacent a lower longitudinal side of
the first panel between a closed, vertical first
position to a second, open ramp position;
 - (b) means to pivotably connect the ramp panels along
adjacent longitudinal aides so as to unfold into an
operable ramp position with the panels held in
15 coplanar relationship when the first of the ramp
panels is in open position, and fold into a storage
position with the first of the ramp panels in closed
position; and
 - (c) means to releasably secure the ramp panels in first
20 position.
2. The foldable vehicle tailgate ramp assembly of claim 1
wherein the corresponding longitudinal sides of adjacent panels are
pivotably connected by means of a hinge assemblies each having

means to limit the relative pivoting of corresponding panels in one direction to a position wherein the top surfaces are substantially coplanar.

3. The foldable vehicle tailgate ramp assembly of claim 2
5 wherein the hinge assembly comprises:

(a) a pair of spaced, aligned hinge sleeves respectively secured to different ones of corresponding longitudinal sides of adjacent panels and a rod rotatably secured within; and

10 (b) a stop block secured to one of these longitudinal sides so as to abut against a surface bearing bar affixed to the other longitudinal side to retain the panels in a coplanar relationship when in ramp position.

15 4. The foldable vehicle tailgate ramp assembly of claim 1 wherein latches are secured to the panels to releasably secure the panels in closed position.

20 5. The foldable vehicle tailgate ramp assembly of claim 4 wherein the latches comprise a pair of conventional latches secured to lateral sides of first panel to releasably secure the first of the ramp panels to the vehicle in vertical orientation when in closed position and a pair of spring-loaded latches secured to the lateral sides of another of the panels to releasably hold the ramp panels in storage position.

6. The foldable vehicle tailgate ramp assembly of claim 5 wherein each of the spring-loaded latches comprise a panel-gripping finger, moveable against the bias of the spring to releasably grip lateral sides of the other ramp panels to hold them in folded positions.

7. The foldable vehicle tailgate ramp assembly of claim 1 wherein a pair of telescopically adjustable vertical support members are affixed to the lateral sides of a central ramp panel to supportably engage a ground surface when the panels are into ramp position.

8. The foldable vehicle tailgate ramp assembly comprising:

(a) a plurality of rectangular ramp panels each having top and bottom surfaces and longitudinal and lateral sides; a first of said panels being pivotably mounted to the vehicle to form a tailgate and the others of said panels being pivotably connected to each other along adjacent longitudinal sides;

(b) a pair of hinge assemblies pivotably connecting the panels at adjacent longitudinal sides so that in operation the panels will unfold and fold between a first folded position wherein the top surfaces of consecutive panels opposedly face one another and a second open, ramp position wherein the top surfaces form a continuous planar ramp surface;

- 5
- (c) a pair of adjustable legs hingedly connected to longitudinal sides of a central panel to provide support to the panels when in ramp position; and
 - (d) latching means to releasably lock respectively the first panel to the vehicle as a tailgate and the other panels to the first panel when the panels are in folded position.

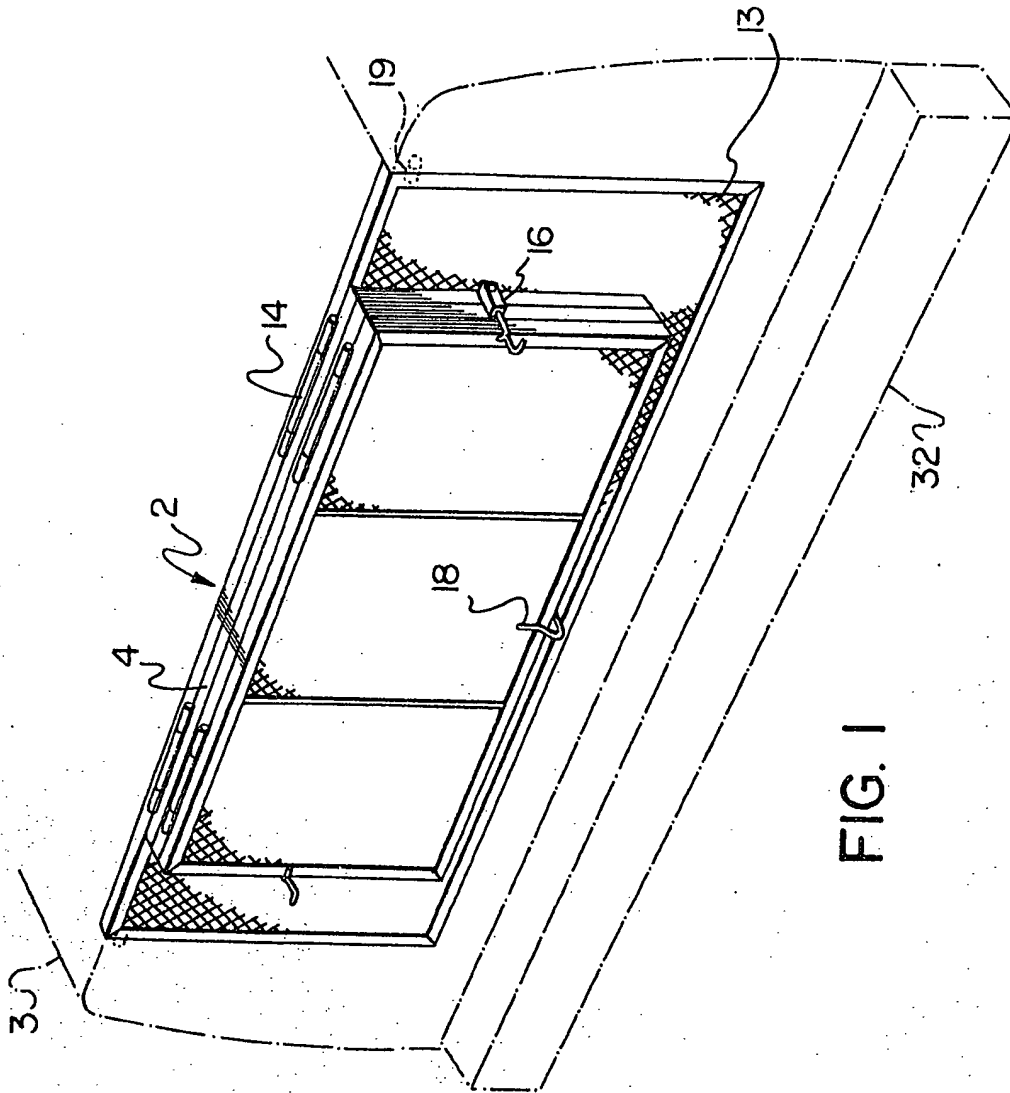
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ABSTRACT OF THE DISCLOSURE

A vehicle tailgate ramp assembly comprising a plurality of rectangular panels pivotally connected to each other in such a way that the assembly can be used as loading ramp when the panels are unfolded. A panel acts as a completely closed tailgate when the panels are folded onto one another.



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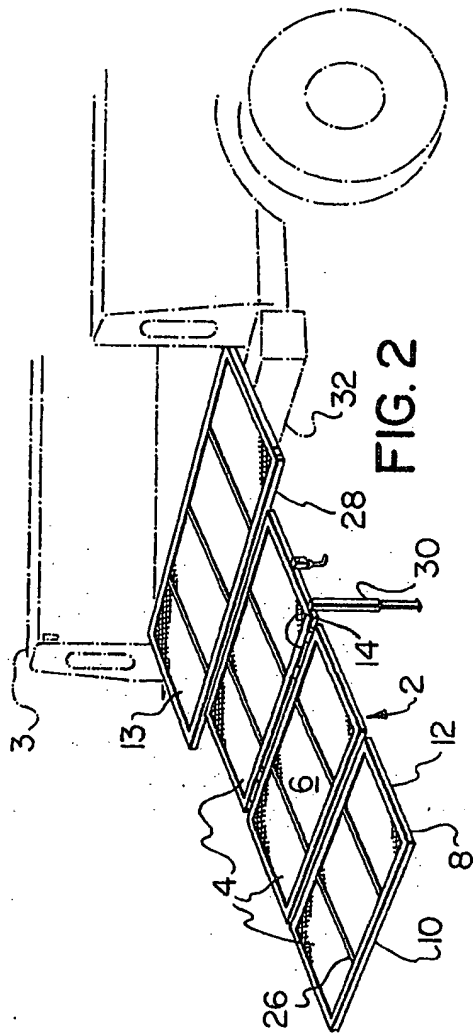


FIG. 2

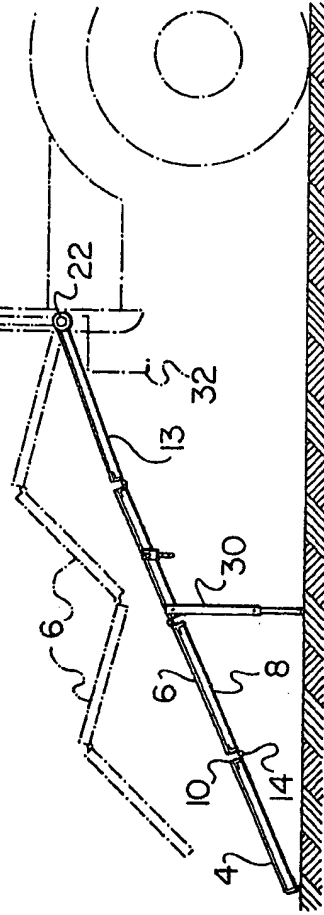
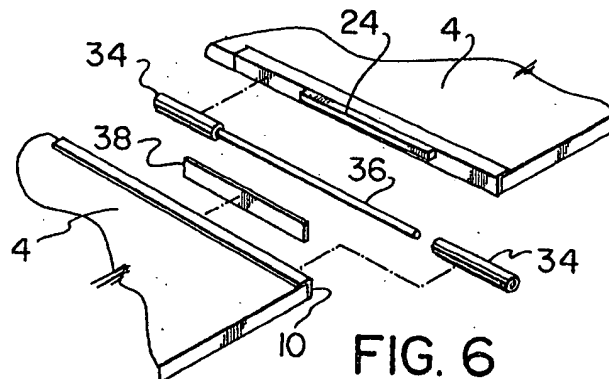
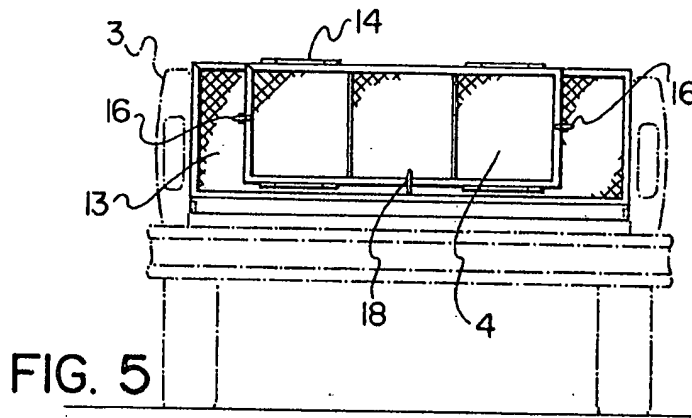
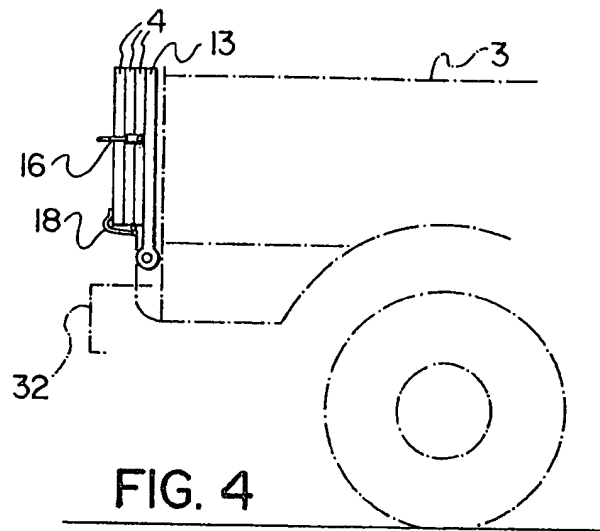


FIG. 3

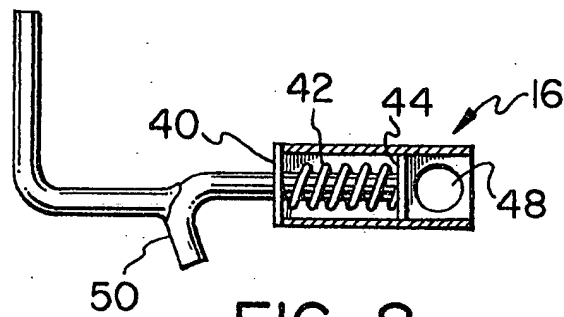
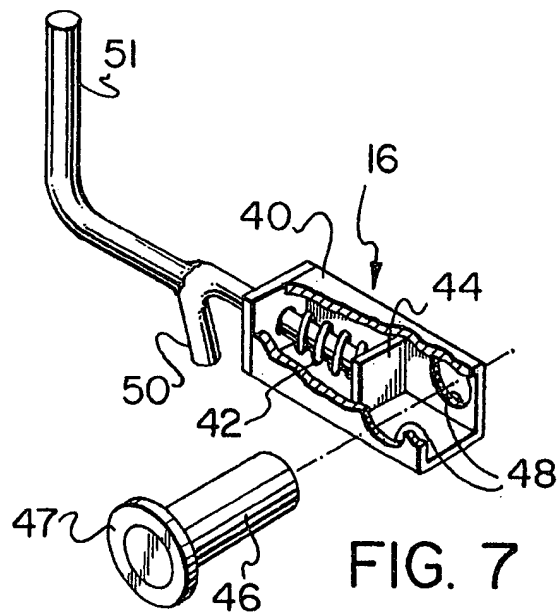
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